PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Roger W. WHATMORE et al. Group Art Unit: 1765

Application No.: 10/069,754 Examiner: A. Alanko

Filed: February 28, 2002 Docket No.: 112113

For: METHOD FOR HERMETICALLY PACKAGING BULK ACOUSTIC RESONATOR DEVICE (AS AMENDED)

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

After entry of the Notice of Appeal filed herewith, Applicants respectfully request review of the Final Rejection mailed June 17, 2005, in the above-identified application.

I. Status of Pending Claims

Claims 1, 2, 4, 6-9 and 15-21 are pending. Claims 1, 2, 4, 6-9 and 15-21 are rejected. No amendments are being filed with this request.

II. Grounds of Rejection Presented For Review

The following grounds of rejection are presented for review:

(1) claims 1, 2, 4, 9-13, 15-17 and 21-25 under 35 U.S.C. §103(a) relying upon U.S. Patent No. 5,747,857 to Eda et al. ("Eda") in view of U.S. Patent No. 6,300,676 to Kawai ("Kawai");

(2) claims 1, 2, 4, 6-13 and 15-25 under 35 U.S.C. §103(a) relying upon Eda in view of Kawai and U.S. Patent No. 5,882,465 to McReynolds ("McReynolds");

(3) claims 1, 2, 4, 9-13, 15-17 and 21-25 35 U.S.C. §103(a) relying upon Eda in view of Kawai and U.S. Patent No. 6,106,735 to Kurle et al. ("Kurle"); and

(4) claims 1, 2, 4, 6-13 and 15-25 under 35 U.S.C. §103(a) relying upon Eda in view of Kawai, McReynolds and Kurle.

Claims 1 and 15 are the rejected independent claims.

The Patent Office acknowledges that Eda does not teach the claimed features of forming holes in a composite wafer after formation of the composite wafer, and filling the holes with metal. In particular, the Patent Office acknowledges that Eda discloses devices having pre-formed holes before the formation of a composite wafer. Eda teaches that the holding member bulk 62 has through holes 66 filled with metal (col. 46, lines 52-57) and afterwards that the holding member bulk 62 and quartz wafer 65 are bonded to each other (col. 47, lines 9-18) to form a composite wafer. Thus, the order of steps as required in claims 1 and 15 (forming a composite wafer, forming holes in the composite wafer and filling the holes with metal, and then separating individual bulk acoustic resonators from the composite wafer) is different from the process order disclosed by Eda (forming holes, filling holes with metal, forming a composite wafer, and separating individual devices from the composite wafer). Thus, Eda cannot be considered to teach or suggest separating individual bulk acoustic resonator devices by sawing the composite wafer after the holes are filled with metal as recited in claims 1 and 15.

At page 5 of the Final Office Action dated June 17, 2005, the Patent Office references col. 9, line 60 to col. 10, line 14 of Kawai and asserts that Kawai remedies Eda's deficiencies. Applicants respectfully disagree with the Office Action's interpretation of Kawai. Kawai discloses depositing a conductive film on the internal wall surface of a communicating hole and extending on a surface of a glass substrate in a structure that contains a single angular velocity detecting element. Kawai does not teach or suggest a composite wafer formed by

bonding a second wafer to the first surface of a first wafer and bonding a third wafer to the second surface of the first wafer, with a plurality of bulk acoustic resonator devices disposed on the first surface as recited in claims 1 and 15. Thus, Kawai does not teach or suggest separating individual bulk acoustic resonator devices from a composite wafer. Hence, Kawai cannot teach or suggest separating individual bulk acoustic resonator devices after the holes are filled with metal as recited in claims 1 and 15.

In addition, Kawai teaches that a communicating hole passes through the glass substrate and into at least a part of the electrode support portion, rather than forming holes in the composite wafer after formation of the composite wafer so that the holes reach metal tracks connected to the bulk acoustic resonator devices and filling the holes with metal as recited in claims 1 and 15. Figure 2 of the present application shows that the holes are formed into the bonding layer 11 which bonds the first wafer and the second wafer. Clearly, Kawai does not teach or suggest forming holes in a composite wafer, but rather forming the holes in a single wafer, which does not remedy the deficiencies of Eda. Specifically, Kawai also does not teach or suggest forming holes in a composite wafer after formation of the composite wafer, and filling the holes with metal as recited in claims 1 and 15.

Furthermore, in the Advisory Action, the Patent Office asserts that Kawai is cited to show that the holes may be formed before or after formation of a composite wafer. Such characterization is incorrect. Kawai teaches forming a simple structure for a single device. Nowhere does Kawai teach or suggest that the order of the steps as taught by Kawai could be used in the more complex structure of a composite wafer of Eda. Thus, nothing in Kawai would have led one of ordinary skill in the art to use a different order of steps in the very different process and devices as described in Eda.

For the foregoing reasons, Applicants respectfully submit that Eda and Kawai, alone or in combination, would not have led one of ordinary skill in the art to the independent

claims 1 and 15 or any of the claims dependent therefrom. Reconsideration and withdrawal of this rejection are thus respectfully requested.

Furthermore, Applicants respectfully submit that McReynolds and Kurle also fail to remedy the deficiencies of Eda. In particular, McReynolds discloses a method for manufacturing a microfluidic device, and is thus directed to a fluid manifold rather than an acoustic resonator. Clearly, McReynolds does not remedy the deficiencies of Eda. That is, McReynolds also does not teach or suggest forming holes in a composite wafer after formation of the composite wafer, and filling the holes with metal as recited in claims 1 and 15. Thus, one of ordinary skill in the art would not have been motivated to combine McReynolds with Eda and/or Kawai.

Kurle discloses a method for producing wafer sensors rather than acoustic resonators. Kurle does not remedy the deficiencies of Eda and/or Kawai. Specifically, Kurle also does not teach or suggest forming holes in a composite wafer after formation of the composite wafer, and filling the holes with metal as recited in claims 1 and 15.

For the foregoing reasons, Applicants respectfully submit Eda, Kawai, McReynolds, and/or Kurle, alone or in combination, would not have led one of ordinary skill in the art to independent claims 1 and 15 or any of the claims dependent therefrom. Reconsideration and withdrawal of these rejections are thus respectfully requested.

III. Conclusion

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that all the pending claims are in condition for allowance. For all of the above reasons, Applicants respectfully request the panel of Examiners to review the June 17, 2005 Final Rejection prior to Appeal and to withdraw the rejections therein.

Respectfully submitted,

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